



Focusing Sustainment Logistics Toward Capabilities Development: Part II

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Part I of this article, published in the May-June 2009 issue of *Defense AT&L* magazine, recommended that life cycle logisticians press to establish more persistent and thorough analyses of fielded defense system sustainment performance and associated operations and support (O&S) costs. Operational logistics analyses, fed consistently into the earliest phases of acquisition by means of stronger business case decision rationale, can affect systems life cycle decisions and management; and they can specifically further a long-standing intent that all early decisions better target logistics supportability that will most affordably sustain systems' technical performance to persistently high degrees of operational availability. While such analyses could be used to greater effect by logistics advocates during the earliest capabilities-determination phases of acquisition, timely analysis is, unfortunately, not routinely cycling back to serve logistics advocacy in driving early-phase systems acquisition.

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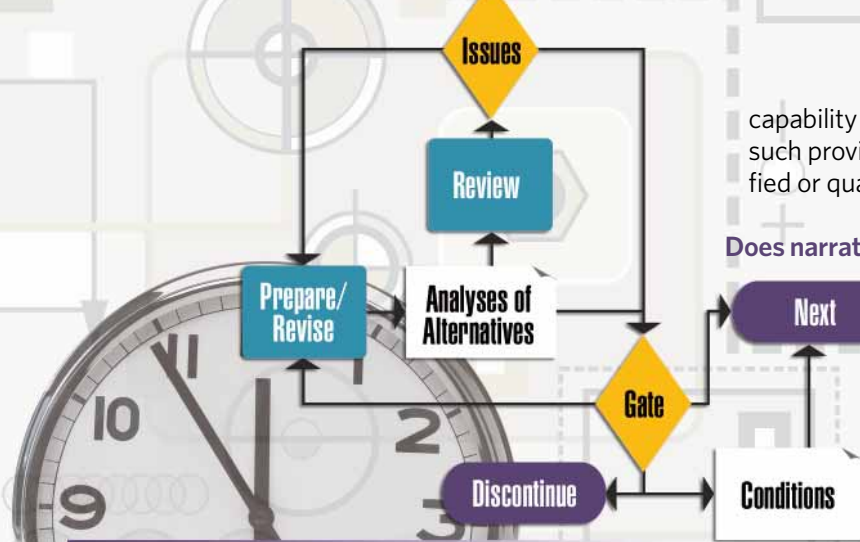
Part II describes the use and leverage of “brought-forward” sustainment analyses to affect major acquisition decisions at each new program review and decision venues of the Department of Navy: the six Gate Reviews. Gate Reviews—also known as Phase-Gate Reviews—are assessments held at critical points of a system development process to reduce risk early and determine the advisability of continuing development. Details on Gate Reviews are provided at the end of Part I. Those Gate-by-Gate benchmarks reflect logistician opportunity to exert a consistent advocacy for decisions that may best lead to optimally affordable life cycle systems sustainment.

Gate 1 Benchmarks

Gate 1 addresses new defense system feasibility in view of the evolving warfighting need; adequacy of the performance capabilities that presently meet

those needs; and opportunities presented by evolving technology. The decision sought is approval of a Joint Capabilities Integration Development System process interim capability document. The JCIDS ICD sets conditions for comprehensive and testable system technical performance parameters, including technical performance related to system reliability, availability, and maintainability (RAM); and diagnostic/prognostic capabilities. At this stage, there is functional assessment of warfighting needs, but no materiel solution is set. Gate 1 decisions authorize an initial analysis of alternatives (AoA) to find such materiel solutions for emerging performance capability needs.

Logisticians must critique and contribute to the warfare sponsor’s functional needs reports, draft an ICD, and draft Gate 1 briefings, keeping in mind the following questions:



Gate-by-Gate benchmarks reflect logistician opportunity to exert a consistent advocacy for decisions that may best lead to optimally affordable life cycle systems sustainment.

Does narrative on warfighting capability needs address all systems performance categories projected for the operational environment? Logisticians must ensure notional RAM performance discussion relates to all other systems' technical performance, since sustainment performance effectiveness will be central to any fielded system's overall operational effectiveness.

Do the ICD and Gate Review briefing narratives express unwarranted presumptions as to logistics support strategy or levels of maintenance? Gate 1 is too early for definitive statements regarding a particular logistics- or maintenance-level strategy for prospective defense systems. The ICD should instead describe the logistics strategy and sustainment infrastructure in use for existing system or systems that are to be replaced or upgraded—that is, starting-point factors only. To determine if presumptions about a sustainment strategy are moving too far ahead at Gate 1 and in the ICD, put sustainment into this context:

- System logistics and maintenance strategies are ultimately a program management prerogative. To discuss as a certainty that a particular strategy is locked in at this pre-Milestone B/ICD stage could constrain forming public/private partnerships made for the sake of logistics infrastructure efficiencies and economies of scale.
- Challenge directive provisions that there shall be no increase to manpower, facilities, training, maintenance levels, or support equipment. Such definitive statements tend to carry over as unchallenged into subsequent JCIDS capability development documents (CDDs) and

capability performance documents (CPDs), where such provisions should instead be technically specified or quantified.

Does narrative on operational scenarios and warfighting performance capability clearly point to subsequent JCIDS CDD supportability-related performance capabilities development parameters? For example, if "persistent presence" is a stated need or if highly autonomous operations are anticipated, then the ICD and Gate Review should both outline a system to be developed (or procured) that exhibits high inherent reliability and maintainability plus advanced self-diagnostics.

Do the ICD and Gate 1 briefs set terms for the subsequent AoA, to include all functional performance categories that will later be expressed as CDD/CPD key performance parameter and key systems attribute terms? Department of the Navy and DoD policy require that sustainment-related KPPs and KSAs be specified: They are "Materiel Availability" KPP; and two KSAs, "Materiel Readiness" and "Ownership Cost." ICD narrative and the Gate 1 briefings must direct the AoA to assess those parameters for each viable alternative. The AoA should take no shortcuts in any category of technical performance capability, just as the ICDs make no strong presumptions as to logistics and maintenance strategies.

The post-Gate 1 AoA begins to project total program life cycle cost. AoA assessments should anticipate the pending CDD Ownership Cost KSA specification range and baseline each viable alternative, specifically in terms of known legacy system O&S cost and affordability analyses that logisticians can help make available. The view to take is that warfighting capability should be designed, developed, and acquired in stronger consideration of the extent to which resultant AoA CDD technical parameters can affordably be sustained to their minimum mandatory (threshold) levels of performance.

Once it has been determined that collective system performance capabilities are to be logistically sustainable to a certain level of operational or materiel availability, AoA findings should not presume a fixed degree of future logistics support funding, or that future funding of logistics will be sufficient only to sustain systems performance at some lesser degrees of availability than the CDD-specified threshold value. In other words, the AoA should not anticipate historical operational funding, but should assess cost to formally specified JCIDS parameter threshold values.

If warfighting capabilities are to replace or upgrade an existing defense system, the logistics and maintenance infrastructure that now sustains the existing systems must provide to the AoA a timely analysis of RAM readiness and associated ownership costs. Life cycle logisticians can ensure that the AoA then uses the data to project a life cycle cost perspective for each materiel alternative presented for subsequent Gate Review consideration.

Gate 1 directs minimum standards for AoA analysis team composition and expertise to assess all facets of technical performance. The assessment must include sustainment performance and O&S cost expertise, so that added facets of life cycle system performance, readiness, and cost are more accurately projected.

Gates 2 and 3 Benchmarks

Gate 2 and Gate 3 reviews are crucial from the perspective of supportability-related performance capability parameter specifications. They occur just before and after the acquisition Milestone A decision point that divides concept assessments and technology development. JCIDS CDD performance capability design and development criteria are set at Gates 2 and 3, by which point operational needs clearly target a materiel solution defense system. Few factors will affect that defense system's life cycle sustainment effectiveness and affordability as strongly as the effectiveness of logistics advocacy during this timeframe.

Logistics effort here is successful if JCIDS CDD supportability and ownership cost capability performance parameters are established among KPP/KSA subset priorities, and if parameter threshold design values were set based upon an analysis of support system performance and ownership costs of pertinent current systems.

When Gate 2 and 3 decisions establish KPP/KSA priority for support and sustainment-related performance capabilities among new systems, that same high (KPP/KSA) systems development prioritization should extend throughout the remainder of the program's life cycle development, specifically into subsequent JCIDS CPDs and major upgrades that may evolve from the initial program. Such a total system/life cycle management precedent will either help or hinder all subsequent logistician planning and execution, making Gates 2 and 3 critical logistician decision points. As a continuation of Gate 1, logisticians at Gates 2 and 3 must address the following issues:

Ensure that RAM performance parameters and threshold values are quantified to an analytic rigor of substantiation on a par with all other system technical performance capability parameters. In terms of JCIDS supportability performance specification, Gates 2 and 3 output should reflect a cohesive approach among program sponsors and offices responsible for life cycle logistics and for O&S phase resource

sponsorship. For example, since 2004, it has been SECNAV 5000-series policy that program sponsors must assume a default consideration for specifying a "supportability" KPP, with concurrence required by the office of life cycle logistics, fleet/ashore readiness, and O&S phase resource sponsorship. The policy works because life cycle sustainment advocates and the O&S resource sponsor fully understand the consequences of Gates 2 and 3 events and act to exert a principal Gate Review role.

Still needed is more consistent sustainment analysis applied to more persuasive business case rationale and specifying a more quantitative set of design/development threshold values for supportability performance capability parameters. To make such stronger Gates 2 and 3 business cases, Services' readiness and cost analysis activities should be targeted to this purpose. System commands and other activities can serve more timely and influential roles by unpinning, in this manner, the major Gates 2 and 3 phase decisions that shape the inherent supportability of the systems they will eventually have to logistically support.

Briefings present a program health and risk assessment, with a subset of sustainability. Ensure that the assessment of sustainability risk is not principally based on operational availability (Ao) or materiel availability (MA). Sustainability risk at the Gates 2 and 3 stages should be based on performance that comprises inherent availability (the materiel readiness KSA plus maintainability). Mean down time and Ao/MA performance are not quantifiable or ongoing at this stage and will be subject to many future variables. They should not be strong factors here in sustainability risk calculation. Another reason is that sustainment phase effort can mitigate inherently poor or slow-to-mature RAM performance after initial operating capability (IOC). This is a conditional factor that should not be allowed to factor into program health/risk determination. Lesser emphasis at this point on Ao/MA as an initial health assessment factor—in favor of inherent R&M—will not diminish sponsor responsibility for setting realistic and challenging RAM performance criteria. Sponsors must, regardless, convey RAM criteria (along with high-decision weight priority and sufficient resources) to program management for development. Keeping technical sustainment as a focus restricts a too-early reliance on later-occurring factors (Ao/MA/mean down time) to mitigate initial poor emphasis on RAM performance development.

The prior two benchmarks deal with the technical and quantified aspects of Gate 2 and 3 program briefings and the draft CDD. Logisticians must now assess in detail the narratives for a specific logistics supportability strategy.


- While draft CDDs may discuss logistics support strategies, and even detailed individual integrated logistics

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support elements, content should primarily advise in terms of overarching, outcome-based life cycle support strategy.

- It is not important here to express how many units or end items may be operational by the initial operating capability and full operating capability dates. It is more important to propose how a logistics support strategy will sustain all program CDD KPP/KSA capability parameters (not just RAM) to their specified threshold performance levels, beginning at IOC.
- If the IOC date falls within the timeframe of the current or projected budget, are sustainment planning and resources sufficient by that milestone to sustain every CDD KPP parameter to its individual threshold value level of performance?
- Is the support strategy clearly an integral part of evolving systems engineering plans; and is it apparent that supportability performance growth will be progressively tested to and throughout operational test and evaluation? It is not enough to ensure that supportability-related technical performance criteria are specified at these Gates. Supportability performance engineering and subsequent testing are inherent to evolving program life cycle management (and related strategic documents.)

Gates 2 and 3 are critical because they lead very quickly to program approval and initiation, especially when there is also a high operational priority that new performance capabilities be rapidly developed and deployed.



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Gates 4, 5, and 6 Benchmarks

At these stages, performance capabilities are established and systems engineering and acquisition strategies are advancing toward formal program initiation. The Milestone B decisions fall notionally between Gate 4 (design specification approval) and Gate 5 (approved solicitation request for proposal). A request for proposal will have included a call for logistics support execution that is performance-based and pegged to the sustainment-related performance parameters and KPP/KSA prioritization that logisticians helped establish during earlier Gate 2 and 3 decisions.

Central to an approach to post-Milestone B Gate Reviews is insistence that all major program decisions now be based on the predictable effects of system life cycle sustainment effectiveness and corresponding ownership cost affordability. As detailed sustainment plans form during these later Gate Reviews, there is increasing opportunity (given logistician visibility) to assess any impact that the individual program under consideration may have on the ability of the broader logistics support infrastructure to sustain readiness at optimal affordability.

As a rule, briefings of sustainment program health at all later Gate Reviews should be viewed as relatively high until continuity of sustainment results from earlier acquisition phases and Gate Review effort is demonstrated. Given the increasingly specific programmatic details in place by these later Gate Reviews, only a few general caveats are needed:

- Do independent cost estimates fully factor the life cycle cost of sustaining RAM parameter capabilities to their specified threshold levels of performance, and are those costs included in future years' programming?
- Do the same or similar metrics used for the predecessor system or systems show that development is progressing towards some percentage improvement in benchmark sustainment and O&S cost affordability?
- Do briefings of evolving logistics program adequacy exactly coincide with the findings of Service-independent logistics assessments?

This two-part article has focused on opportunities taken (or lost) during the earliest phases of acquisition. Sustainment/O&S phase logistics is addressed only to recommend uses for the sustainment analysis that can be brought forward into earliest-phase activities. I hope to counter a too-broad perception that logisticians' work commences in earnest only at or around Milestone B. From my perspective, this point is well behind the curve for concerted work across the span of life cycle logistics communities.

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